GAU 1764
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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Date: August 27, 2001

In re Application of:
DAVID J. EDLUND, WILLIAM A. PLEDGER
and TODD STUDEBAKER

Serial No. : 09/802,361 Group Art Unit: 1764

Filed : March 8, 2001

For : FUEL PROCESSOR AND SYSTEMS AND DEVICES CONTAINING THE SAME

Commissioner for Patents
Washington, D.C. 20231

S i r:

INFORMATION DISCLOSURE STATEMENT
UNDER 37 C.F.R. §§ 1.56, 1.97 AND 1.98

Pursuant to Applicants' duty of disclosure required under 37 C.F.R. § 1.56, Applicants are submitting the enclosed, completed PTO forms 1449 with copies of each reference as required by 37 C.F.R. § 1.97 and 1.98. The listing of any reference or the submission of a copy of any reference shall not be deemed as an admission that the listed or submitted reference is prior art for this application.

Japanese Patent No. 45-14404 was listed on the face sheet to U.S. Patent No. 5,888,273 and no translation or English language abstract was provided. The patent appears to disclose a gas purification unit having a plurality of membrane tubes 1 through which a feed stream 4 is separated into streams 3C and 6.

Japanese Patent No. 45-2642 was listed on the face sheet to U.S. Patent No. 5,888,273 and no translation or English language abstract was provided. The patent

appears to disclose a gas purification unit in which a feed stream 3 is passed through several passages to separation membranes, where the feed stream is separated to form streams 4 and 17. Applicant understands that reference numeral 1 refers to a flange, reference numeral 2 refers to a base, reference numeral 3 refers to a source gas introduction line, reference numeral 4 refers to a gas exhaust line, reference numeral 5 refers to a cylinder, reference numeral 6 refers to a guide structure, reference numeral 7 refers to an impure gas introduction control, reference numeral 8 refers to a square pipe, reference numeral 9 refers to a square-shaped hydrogen permeable board, reference numeral 10 refers to a palladium alloy membrane, reference numeral 11 refers to a support board, reference numeral 12 refers to a peripheral weld, reference numeral 13 refers to a pure hydrogen extractor, reference numeral 14 refers to a flange, reference numeral 15 refers to a pure hydrogen mixture chamber, reference numeral 16 refers to a passage member, reference numeral 17 refers to a pure hydrogen mixture extraction nozzle, reference numeral 18 refers to a cover, reference numeral 19 refers to an electric heater, reference numeral 20 refers to a source gas preparatory heating portion for heating gas outside the outer wall of the square pipe and inside the inner wall of the circular pipe, and reference numeral 21 refers to an insert for an electric heater to regulate the temperature of the pure hydrogen permeable cell.

English language abstracts are provided for Japanese Patent Nos. 1-145302 and 1-145303.

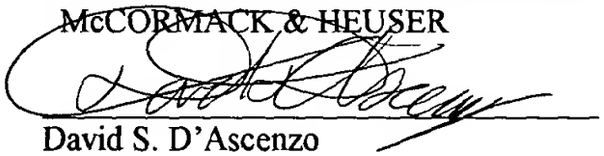
Japanese Patent No. 6-134244 was listed on the face sheet to U.S. Patent No. 5,888,273 and no translation or English language abstract was provided. The patent appears to disclose a gas purification unit in which a feed stream is separated into plural streams.

International Patent Application No. WO 97/43796 claims to disclose a membrane reactor that catalytically reacts methanol to produce a product stream containing hydrogen, carbon dioxide and carbon monoxide, filters carbon dioxide from the reaction product stream, and then catalytically converts the carbon monoxide methane into methane prior to delivery of the product stream to a fuel cell.

Applicants recognize that there are many references listed in the enclosed PTO 1449 Forms. However, Applicants are prosecuting dozens of applications related to the field of fuel processing systems and fuel cell systems, and accordingly are continuously receiving new information from Applicants' own searches, the U.S. Patent and Trademark Office and foreign patent offices. Applicants appreciate in advance the Examiner's time and understanding.

Respectfully submitted,

KOLISCH, HARTWELL, DICKINSON, McCORMACK & HEUSER



David S. D'Ascenzo
Registration No. 39,952
Of Attorneys for Applicants
520 S.W. Yamhill Street, Suite 200
Portland, Oregon 97204
Telephone: (503) 224-6655
Facsimile: (503) 295-6679

CERTIFICATE OF MAILING

I hereby certify that this correspondence, the attached PTO forms 1449 and copies of references are being deposited with the United States Postal Service as first class mail and addressed to: Commissioner for Patents, Washington, D.C. 20231 on August 27, 2001.

David S. D'Ascenzo

FORM PTO-1449	DOCKET NUMBER	APPLICATION NUMBER
INFORMATION DISCLOSURE CITATION IN AN APPLICATION	NPW 312	09/802,361
	APPLICANTS DAVID J. EDLUND, WILLIAM A. PLEDGER and TODD STUDEBAKER	
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U.S. PATENT DOCUMENTS

EXAMINER INITIAL	DOCUMENT NUMBER	DATE	NAME	CLASS	SUB CLASS	FIL. DATE IF APPROP.
	2,824,620	2/25/1958	De Rosset			
	3,144,312	8/11/1964	Mertens			
	3,208,198	9/28/1965	Rubin			
	3,336,730	8/22/1967	McBride et al.			
	3,338,681	8/29/1967	Kordesch			
	3,350,176	10/31/1967	Green et al.			
	3,368,329	2/13/1968	Eguchi et al.			
	3,450,500	6/17/1969	Setzer et al.			
	3,469,944	9/30/1969	Bocard et al.			
	3,520,803	7/21/1970	Iaconelli			
	3,524,819	8/18/1970	Guerrieri			
	3,564,819	2/23/1971	Neulander et al.			

FOREIGN PATENT DOCUMENTS

	DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUB CLASS	TRANSLATION YES	TRANSLATION NO
	JP 45-14404	5/1970	Japan				X
	JP 45-2642	9/1970	Japan				X

OTHER DOCUMENTS

		English language abstract of Japanese Patent No. 432150, 1992.
		English language abstract of Japanese Patent No. 513230, 1993.

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	3,665,680	5/30/1972	Heuser			
	3,881,897	5/6/1975	Faure et al.			
	3,920,416	11/18/1975	Houseman			
	3,955,941	5/11/1976	Houseman et al.			
	3,972,695	8/3/1976	Buckley et al.			
	3,982,910	9/28/1976	Houseman et al.			
	4,003,725	1/18/1977	Bunn, Jr. et al.			
	4,056,373	11/1/1977	Rubin			
	4,098,959	7/4/1978	Fanciullo			
	4,098,960	7/4/1978	Gagnon			
	4,254,086	3/3/1981	Sanders			
	4,381,641	5/3/1983	Madgavkar et al.			

FOREIGN PATENT DOCUMENTS

	DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUB CLASS	TRANSLATION YES	TRANSLATION NO
	JP 1-145302	6/1989	Japan				X
	JP 1-145303	6/1989	Japan				X

OTHER DOCUMENTS

		English language abstract of Japanese Patent No. 1-145302.
		English language abstract of Japanese Patent No. 1-145303.

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	4,430,304	2/7/1984	Spurrier et al.			
	4,444,158	4/24/1984	Yoon			
	4,468,235	8/28/1984	Hill			
	4,504,447	3/12/1985	Spurrier et al.			
	4,654,063	3/31/1987	Auvil et al.			
	4,684,581	8/4/1987	Struthers			
	4,713,234	12/15/1987	Weirich et al.			
	4,810,485	3/7/1989	Marianowski et al.			
	4,849,187	7/18/1989	Uozu et al.			
	4,981,676	1/1/1991	Minet et al.			
	5,158,581	10/27/1992	Coplan			
	5,198,002	3/30/1993	Mei et al.			

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	DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUB CLASS	TRANSLATION YES	TRANSLATION NO
	EP 0434562 A1	6/26/1991	EPO			X	
	JP 6-134244	5/1994	Japan				X

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		English language abstract of Japanese Patent No. 604070, 1994.
		English language abstract of Japanese Patent No. 710910, 1995.

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	5,215,729	6/1/1993	Buxbaum			
	5,225,080	7/6/1993	Karbachsch et al.			
	5,226,928	7/13/1993	Makabe et al.			
	5,229,102	7/20/1993	Minet et al.			
	5,326,550	7/5/1994	Adris et al.			
	5,354,547	10/11/1994	Rao et al.			
	5,376,167	12/27/1994	Broutin et al.			
	5,382,271	1/17/1995	Ng et al.			
	5,449,848	9/12/1995	Itoh			
	5,458,857	10/17/1995	Collins et al.			
	5,498,278	3/12/1996	Edlund			

FOREIGN PATENT DOCUMENTS

	DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUB CLASS	TRANSLATION YES	TRANSLATION NO
	WO 97/43796	11/1997	WIPO				X
	WO 99/30806	6/1999	WIPO			X	

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		English language abstract of Japanese Patent No. 11116202, 1999.
		English language abstract of Great Britain Patent No. 2,305,186.

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	5,516,344	5/14/1996	Corrigan			
	5,518,530	5/21/1996	Sakai et al.			
	5,520,807	5/28/1996	Myrna et al.			
	5,525,322	6/11/1996	Willms			
	5,536,405	7/16/1996	Myrna et al.			
	5,580,523	12/3/1996	Bard			
	5,589,599	12/31/1996	McMullen et al.			
	5,637,259	6/10/1997	Galuszka et al.			
	5,639,431	6/17/1997	Shirasaki et al.			
	5,645,626	7/8/1997	Edlund et al.			
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		Chai, M., et al., "Promotion of Methane Steam Reforming Using Ruthenium-Dispersed Microporous Alumina Membrane Reactor," Chemistry Letters, The Chemical Society of Japan, pp. 41-44 (1993).
		"Compact, Lightweight Fuel Reformer for Fuel Cells," Argonne National Laboratory/U.S. Department of Energy (July, 1996).

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	5,734,092	3/31/1998	Wang et al.			
	5,738,708	4/14/1998	Peachey et al.			
	5,741,605	4/21/1998	Gillett et al.			
	5,782,960	7/21/1998	Ogawa et al.			
	5,795,666	8/18/1998	Johnssen			
	5,811,065	9/22/1998	Sterenberg			
	5,821,185	10/13/1998	White et al.			
	5,833,723	11/10/1998	Kuwabara et al.			
	5,858,314	1/12/1999	Hsu et al.			
	5,861,137	1/19/1999	Edlund			
	5,874,051	2/23/1999	Heil et al.			

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		Edlund, Dr. David and William Pledger, "Development of a Compact and Economical Steam Reformer for Fuel-Cell Systems," Fifth Grove Fuel Cell Symposium, Commonwealth Institute, London, U.K., p. 6 (September 22-23, 1997).
		Edlund, David J. and William A. Pledger, "The Practical Use of Metal-Membrane Reactors for Industrial Applications," The 1995 Membrane Technology Reviews, pp. 89-97 (November, 1994).

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	5,932,181	8/3/1999	Kim et al.			
	5,938,800	8/17/1999	Verrill et al.			
	5,997,594	12/7/1999	Edlund et al.			
	6,103,411	8/15/2000	Matsubayashi et al.			
	6,120,923	9/19/2000	Van Dine et al.			
	6,152,995	11/28/2000	Edlund			
	6,165,633	12/26/2000	Negishi			
	6,171,574	1/9/2001	Juda et al.			
	6,190,623	2/20/2001	Sanger et al.			
	6,221,117	4/24/2001	Edlund et al.			

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		Minet, R. G., et al., "Experimental Studies of A Ceramic Membrane Reactor for the Steam/Methane Reaction at Moderate Temperatures (400-700°C)," Symposium on Natural Gas Upgrading II Presented before The Division of Petroleum Chemistry, Inc., Meeting of American Chemical Society, San Francisco, California, U.S.A., pp. 245-48 (April, 1992).
		Oertel, Michael, et al., "Steam Reforming of Natural Gas with Integrated Hydrogen Separation for Hydrogen Production," Chemical Engineering Techology, Vol. 10, pp. 248-55 (1987).

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		Piwetz et al., "Hydrodesulfurization and Prereforming of Logistic Fuels for Use in Fuel Cell Applications," presented at the 1996 Fuel Cell Seminar held Nov. 17-20, 1996 in Orlando, Florida, pp. 780-783.
		Privette et al., "Status of SOFCo SOFC Technology Development," presented at the 1996 Fuel Cell Seminar held Nove. 17-20, 1996 in Orlando, Florida, pp. 206-209.
		Yang, Ralph T., "Gas Separation by Adsorption Processes," pp. 253-60, Butterworth Publishers, 1987.

EXAMINER	DATE CONSIDERED